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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/757,886	01/10/2001	Bernardinus Henricus Bosmans	TS0968 (US)	8086

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Shell Oil Company
Legal-Intellectual Property
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EXAMINER

BUSHEY, CHARLES S

ART UNIT PAPER NUMBER

1724

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/757,886	Applicant(s) BOSMANS ET AL.	
	Examiner Scott Bushey	Art Unit 1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7 and 11-17 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7 and 11-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 14-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 14, line 1, "the rectangular downcomers" lack antecedent basis since the claims from which claim 14 depends recites only a single "downcomer".

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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4. Claims 7, and 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 092 262 A1.

EP 0 092 262 A1 (Figs. 1 and 2) substantially discloses applicant's invention as recited by instant claims 7, and 11-14, except for the specific recitation that the lower end cross-section of the downcomer is less than 40%, preferably between about 5 and 40%, and more preferably between about 10% and 30% of the upper end cross-section of the downcomer, as recited by instant claims 7, 11, and 12, respectively, the downcomer extending between about 50 and 90% of the tray spacing below the tray, as recited by claim 7, the liquid discharge opening being an elongated opening, as recited by instant claim 13, and each of the downcomers extending entirely across the respective tray, as recited by instant claim 14. The EP reference does disclose that the lower end cross-section of the downcomer, according to the reference drawings, is about 33% of the upper end cross-section of the downcomer (see Figs. 1 and 2), that the downcomers extend at least about 50% of the tray spacing below the tray (see Fig. 1), the liquid discharge opening is in the form of a series of circular openings fed by an elongated channel opening, and that at least some of the downcomers extend entirely across the tray of the reference (see Fig. 2). The reference also teaches that the downcomers "pass through the tray to a predetermined height above the upper surface of said tray and predetermined distance below the lower surface of said tray" and that the downcomers "have a configuration resembling a frustum in cross-section."

Further, EP '262 teaches:

The aggregate area of the liquid discharge openings 6 in each downcomer duct 4 should be sufficient for discharging all of the liquid flowing downwards through the column interior at the intended liquid loading and should be restricted with respect to the horizontal cross-sectional areas of the lower parts of the downcomer ducts so as to maintain in said downcomer ducts a column of liquid which exerts at the liquid discharge

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openings 6 a hydrostatic head sufficient to prevent ascending gas from entering these downcomer ducts 4.

This teaching would have reasonably suggested to one of ordinary skill in the art that the cross-sectional area relationship between the lower end and the upper end of the downcomer at tray level is a result-effective variable. It is noted that this is consistent with applicant's acknowledged prior art (specification, pp 1-2), which appreciated the cross-sectional area relationship as a tray design consideration.

In view of the above teachings, it would have been obvious for an artisan at the time of the invention, based upon the prior art teachings as a whole to determine by routine experimentation a workable or even optimum range of lower end cross-sectional area to upper end cross-sectional area ratios, thus arriving at the apparatus encompassed by instant claims 7, and 11-14. Note In re Peterson, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382 (Fed. Cir. 2003); In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980); In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

With respect to the distance by which a downcomer extends above or below a tray, as above such is suggested as a result-effective variable in EP '262. Accordingly, it would have been obvious for an artisan at the time of the invention, based upon the prior art teachings as a whole to determine by routine experimentation a workable or even optimum range of distances by which a downcomer extends above or below a tray, thus arriving at the apparatus encompassed by instant claims 7, and 11-14. In re Peterson, 315 F.3d 1325, 1330, 65 USPQ2d 1379, 1382 (Fed. Cir. 2003); In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980); In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

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5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0 092 262 as applied to claims 7, and 11-14 above, and further in view of Jenkins.

EP 0 092 262 (Figs. 1 and 2) as applied to claims 7, and 11-14 above, substantially discloses applicant's invention as recited by instant claim 15, except for the downcomers being alternately arranged relative to a diametrical line that divides the tray into two sections.

Jenkins (Abstract; Figs. 4, 13 and 14; col. 6, lines 10-13) disclose trays divided into sections along a diametrical line, and downcomers arranged alternately relative to the line on each of the tray sections. It would have been obvious for an artisan at the time of the invention, to modify the trays, as taught by the primary reference, to include two sections divided along a diametrical line, and to provide alternating downcomers on each of the sections, in view of Jenkins, since such would allow for greater contact between the phases on each of the trays within the column.

6. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the reference combination as applied to claim 15 above, and further in view of either Sampath et al or Yu et al.

The reference combination as applied to claim 15 above, substantially discloses applicant's invention as recited by instant claims 16 and 17, except for inlet weir means being provided between the area just below the liquid discharge openings of the respective downcomers and the adjacent bubble area.

Sampath et al (106 in Fig. 3) and Yu et al (4 in Fig. 2) each alternatively disclose inlet weir means being provided between the area just below the liquid discharge openings of the respective downcomers and the adjacent bubble area. It would have been obvious for an artisan

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at the time of the invention, to provide the area just below the liquid discharge openings of the respective downcomers as suggested by the reference combination as applied to claim 15 above, with an inlet weir, in view of either of Sampath et al or Yu et al, since such would even the flow of liquid across the bubble zone, thereby maximizing the phase contact on the tray in a well known manner.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott Bushey whose telephone number is (571) 272-1153. The examiner can normally be reached on Monday-Thursday 6:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Scott Bushey
Primary Examiner
Art Unit 1724


6-30-04

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